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## **1998 Keynote Address**

### **School Shootings and School Violence: What's Going On and Why?**

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#### **Abstract**

Recent data, although limited, suggest that school shootings and school violence have increased in the U.S. Social factors that are converging in the 1990s appear to be contributing to the youth violence problem. These factors include institutional change, societal influences, and situational factors that affect some youths more than others. These variables make children and adolescents more vulnerable to behaving inappropriately and coping maladaptively than youths who have different life experiences. After the discussion of these social factors and their effects, individual factors that identify youths at greater risk of choosing violent solutions to life's challenges are highlighted.

#### **Introduction**

The massacre at Jonesboro Middle School on March 24, 1998, happened in a small rural Southern community and became a global event. Time and Newsweek, weekly news magazines that sell millions of copies in the U.S. and across the world, prominently displayed the two young killers, ages 11 and 13, on their covers. These two "kids" were accused of killing four girls and a teacher and wounding 10 more in an ambush of their fellow students.

These two boys did more than allegedly take the lives of five people, however. In a matter of seconds, armed with semiautomatic weapons, they forever changed the reality of millions of children in the United States who now wonder when they go to school each morning whether they too will be shot by a fellow classmate.

This fear of annihilation by "kids" in the hall or on the playground is a new phenomenon. I can honestly say that when I was growing up the thought that I would be shot and killed when I went out to recess or responded to a fire alarm in my school building never even entered my mind -- not even for a split second. I have asked audiences of professionals and university students did they ever fear as a child that they would be shot by a fellow classmate. Always, my question is met with denial and disbelief, typically followed by anguish and sadness.

#### **Multiple School Shootings in U.S. Schools**

Data indicate that the type of school shooting exemplified by the Jonesboro massacre has become more common in recent years. These shootings are characterized by multiple victims, often randomly selected. The killings seem to be an explosion of feeling dumped on an

amorphous target rather than directed at a particular individual whom the assailant perceives has injured him.

I found 14 incidents involving multiple shootings of this type from 1993 through 1998. A very different picture emerged when I examined these incidents by calendar years (1/1-12/31) and by academic years (8/1-6/30). As revealed in Table 1, 8 of the 14 incidents of multiple shootings in schools occurred during the most recent school year, 1997-1998.

**Table 1. Multiple Shootings by Calendar and Academic Year**

<u>Calendar year</u>		<u>Academic year</u>	
1993	2 incidents	92/93	2 incidents
1994	0	93/94	0
1995	2	94/95	0
1996	1	95/96	3
1997	4	96/97	1
1998	5	97/98	8

Table 2 provides additional data on these multiple school shootings. Perusal of these incidents leads to four observations. Drawing firm conclusions at this point is ill-advised given the small number of cases and the possibility that the academic year 1997-98 might be an anomalous year. With these caveats in mind, it behooves us to note the following:

First, the killings and wounding have become more concentrated over the time frame. Over the five to six year period, 30 people were killed and 57 were wounded in these 14 incidents of multiple school shootings. During the academic year 1997-1998, 18 of the 30 dead (60 percent) were killed and 52 of the 57 wounded (91 percent) were injured.

Second, the number of victims killed or wounded per incident has increased. Although the numbers of incidents are very small to permit conclusions, an increasing trend is noticeable. The number of victims killed or wounded in the two incidents in 1992/93 averaged 2; for the three incidents in 1995/96, it averaged 3; for the one incident in 1996/97, it was 4; and for the 8 incidents in 1997/98, it averaged 9.

Third, the age of the assailants appears to be getting younger over time. Of 15 youths involved in the 14 incidents over the five to six year time frame, 8 were 14 or under. Of the 9 youths involved in the academic year 1997/98, 7 were 14 or under. The high proportion of youths under 14 involved in the school homicides is in stark contrast to figures on juvenile homicide offenders in general. Approximately 88 percent of juveniles arrested for murder in the U.S. are ages 15, 16, and 17 years old (Heide, 1999).

**Table 2. Multiple Shootings in U.S. Schools**

<i>Year (Academic)</i>	<i>No.</i>	<i>Suspect Age</i>	<i>Location</i>	<i>No. Dead</i>	<i>No. Wounded</i>
1992/93	2	17	Grayson, KY (1/18/93)	2	0
		17	Amityville, NY (2/11/93)	1	1
				(3)	(1)
1993/94	0			0	0
1994/95	0			0	0
1995/96	3	16	Blackville, SC (10/12/95)	2	0
		17	Lynnville, TN (11/15/95)	2	1
		14	Moses Lake, WA (2/2/96)	3	1
				(7)	(2)
1996/97	1	16	Bethel, AL (2/19/97)	2	2
1997/98	8	16	Pearl, MS (10/1/97)	3	7
		14	W. Paducah, KY (12/1/97)	3	5
		14	Stamps, AR (12/15/97)	-	2
		11, 13	Jonesboro, AR (3/24/98)	5	10
		14	Edinboro, PA (4/24/98)	1	3
		14	Pomona, CA (4/28/98)	2	1
		15	Springfield, OR (5/21/98)	4	22
		14	Richmond, VA (6/15/98)	0	2
				(18)	(52)
<b>Total For 14 Incidents</b>					
1992-1998				(30)	(57)
<i>Academic year 97/98</i>				<i>(60%)</i>	<i>(91%)</i>

## School Violence in U.S. Schools

School shootings and mass killings are among the most extreme acts of violence in our nation's schools. There are less deadly violent victimizations that, unlike multiple school shootings, occur daily in schools across the United States and leave students, parents, and communities in the grips of fear. A 1993 national school-based survey of a representative sample of high school students revealed, for example, that more than 4 percent of responding students missed a day of school each month because they feared for their public safety at school or while traveling to or from school. In a 1994 national survey of parents with children in public school, 40 percent of parents of high school students related that they were worried about their child's safety in school or on their way to, and from, school. In the 1994 National League of Cities survey of 700 communities across the nation, 80 percent of respondents reported that violence was a serious problem in classrooms, hallways, and playgrounds; 40 percent indicated that violence in schools had risen noticeably during the past five years. Moreover, of the schools participating in the survey, 25 percent related that students had died or sustained injuries for which they were hospitalized as a result of violence (Arnette and Walsleben, 1998).

Recently released data from the 1989 and 1995 School Crime Supplement to the National Crime Victimization Survey indicate that criminal violent victimizations in school have increased (U.S. Department of Justice, 1998). These data provide snapshots of students' reports of crime in school during the six months preceding the surveys taken in 1989 and 1995. Nationally representative samples of approximately 10,000 students between the ages of 12 and 19 were surveyed during the two time periods. To be eligible to participate, respondents had to have been in school at some point during the six months preceding the interview. School crime was defined as occurring in the school building, on school grounds, or on a school bus. Criminal violent victimization was defined as involving physical attacks (assaults) or the taking of property by force, weapons, or threats (robberies).

Compared to 1989, students in 1995 were more likely to report being the victim of a criminal violent incident. In 1989, 3.4 percent of students surveyed indicated that they had been physically attacked or had property taken by actual or threatened violence; in 1995, the percentage increased to 4.2 percent. While those percentages may seem small, when extrapolated to the population at risk, the magnitude of the problem of school violence is more apparent. Caution is advised when extrapolating from a sample of 10,000 to the universe, in this case, 21,554,000. With this caveat in mind, extrapolation would suggest that more than 1,000,000 students were the victims of a violent crime in a school building, on school grounds, or on a school bus sometime between the beginning of July 1994 and the end of June 1995.

Comparison of the 1989 and 1995 data revealed several important findings with respect to gender, age, and grade level. Violent victimizations rose for both boys and girls. However, while boys were more likely to be the victims of violent school crimes, the increase in the percentage of girls who reported violent victimizations (from 2.0 percent to 3.3 percent) was higher than that for boys (from 4.8 percent to 5.1 percent).

The percentage of youths reporting violent victimization in school was inversely related to age for youths ages 12 through 17 during both time periods. In 1995, the percentages of youths who reported being a victim of violent crime decreased consistently from 6.8 percent of 12-year-olds to 1.9 percent of 17-year-olds. Similarly, the percentage of youths who indicated that they had been a victim of violent crime was negatively associated with grade level. In 1995, the percentages of school children who reported violent criminal victimization decreased continuously from 6.7 percent of six graders to 1.7 percent of twelfth graders.

Compared to 1989, students in 1995 were more likely to report that street gangs were in their school (15.3 percent vs. 28.2 percent) and that drugs were available at their school (64.8 percent vs. 67.2 percent). Interestingly, close inspection of these data revealed that these problems appear to be correlated with criminal violent victimization at school. Student reports of having been a victim of a violent crime at school were related to street gang presence in their schools and to student reports of drug availability in their schools.

Data on the presence of guns in school, only available for 1995, were alarming. Of those surveyed, 12.7 percent reported that within the last six months they knew someone who brought a gun to school and 5.3 percent indicated that they had seen a student with a gun at school during this time period. These figures, when extrapolated, would suggest that more than 3,000,000 students knew someone who brought a gun to school and more than 1,000,000 students had actually seen a student with a gun in school within a six month period (U.S. Department of Justice, 1998).

### **Social Factors Contributing to School Violence And Shootings<sup>1</sup>**

The data on school shootings and school violence indicate that there is a problem in our schools with respect to violent criminal victimization and suggest it is getting worse over time. For generations, the 3 R's have stood for "reading, writing, and arithmetic." If we don't want the 3 R's to become "reading, writing, and run for cover" for this generation of school children, we need to understand why we are seeing more violence by youths in the 1990s in schools and other settings.

There are social factors that are converging in the 1990s that appear to be contributing to the youth violence problem. These factors include institutional change, societal influences, and situational factors that affect some youths in American society more than others. These variables make children and adolescents more vulnerable to behaving inappropriately and coping maladaptively than youths who have different life experiences. After discussing these social factors and their effects, I will turn to individual factors that identify youths at greater risk of choosing violent solutions to life's challenges.

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<sup>1</sup> Some of the material contained in the remainder of this paper previously appeared in Heide, 1997, 1999.

## **Institutional Change**

Dramatic changes have occurred in societal institutions over the last generation that seriously impact on the socialization of children. Historically, families, religious institutions, schools, and communities played major roles in helping children become productive citizens and contributing members of society. Today, these institutions have undergone major changes that have severely curtailed their sphere of influence.

The change in family structure is by far the most serious. More than in other generations, children and adolescents today are growing up in an era beset by "an overall decline of the extent and influence of the family from the extended multigenerational family, to the nuclear family, to the single parent family, to the 'no parent' family of street children" (Friedman 1993, p. 509). With the decline of the family in the United States, the task of socializing children has become more difficult. More children today, compared to the past, are being raised by single mothers. Due to the demands placed on single parents, many children today, relative to their counterparts of even a generation ago, are not learning acceptable ways of behaving. In many households, again due to changes in the family, positive male role models are not available. As a result, appropriate ways of acting as a man are not being taught. In addition, values are not being reinforced; codes of right and wrong are not being effectively transmitted.

The declining power of religious institutions has also taken place over the last generation. Churches and synagogues have traditionally reinforced acceptable codes of behavior and standards of right and wrong. They have played an important role in value transmission. As Church attendance by families declined, many youth in America lost an important voice in the call to behave as law-abiding and moral people.

The loss of authority of teachers and other school personnel has coincided with the deteriorating influence of the family and the churches. Teachers report today that much of their time is spent trying to maintain order in their classrooms. Respect for the teacher's authority, once freely accorded by students and their parents, is no longer a given. For example, seventy percent of the high school students surveyed in the Public Agenda's report, Getting by: What American teenagers really think about their schools, indicated that disruptive students were a serious problem in their schools (Sloan, 1997). Teachers complain that when they try to discipline students, they frequently are challenged by parents who want to know why they are "picking on" their children.

Not surprisingly, this generation of youths, more than other generations, is beset by a loss of communities. The decline in adult authority at the level of families, religious institutions, and schools has clearly impacted on the role of adults in community. For generations, neighbors frequently kept an eye out on children playing in the schoolyard or congregating on the street corner. Adults would step in to offer guidance and even correct children for minor transgressions, such as smoking or using bad language. But rarely do adults get involved anymore in the 1990s. Some maintain that they are too busy with work and other commitments. Others, however, insist that they are afraid that they will be rebuffed by some adults for daring to

correct others' children or that they will be harmed by youths who resent their intrusion into the youths' lives.

## **Societal Influences**

In addition to fundamental institutional change, youths growing up in the 1990s are subjected to societal influences that send confusing messages to them. These include the crisis in leadership and the lack of heroes available today to serve as role models. The saturation of violence in society and changes with respect to firearms are also perplexing to many.

In contrast to previous generations, children and adolescents today are living in a country that has been experiencing a crisis in leadership and lack of heroes. In the past, U.S. Presidents, successful entertainers, and legendary sports figures were presented to the youth of America as people to emulate. In the 1990s, the personal ethics and behavior of many of these individuals have been seriously questioned. Government leaders who break campaign promises and involve themselves in money and sex scandals have shown that many politicians today deny responsibility for their behavior and their decisions. When leaders of our country are no longer expected to keep their word and are not held accountable, some youths become cynical about following societal dictates. When police officers are viewed on nationwide television repeatedly beating an African-American in their custody and are proven to be lying on the witness stand in the case of another African-American man, adolescents, particularly those from minority groups, increasingly lose faith in a criminal justice system that is supposed to protect them and to dispense equal justice. When world class athletes and notorious gangsta rappers are accused of violent criminal acts, some adolescents feel free to adopt similar courses of behavior.

At a time when heroes and moral figures appear to be sorely lacking, American society has become saturated with violence. Witnessing violence has been correlated with lessened inhibition to use violence (Prothrow-Stith and Weissman, 1991). Over the last two decades, TV, including the evening news, and films have become increasingly more violent (Levin and Fox, 1985; Prothrow-Stith and Weissman, 1991; Fox and Levin, 1994). Violent videogames and gangsta rap music provide graphic scenes and messages of violence. Scores of youths have seen violence in their own homes and in their neighborhoods. To many youths today, the world is a violent place. Accordingly, many youths feel compelled to carry guns and are prepared to use violence when they perceive the situation as warranting it (Heide, 1997, 1998).

Not only do our youths grow up in a world that encourages violence, those in the United States are increasingly finding themselves surrounded with the tools which make acts of violence quick and easy (Sheley and Wright, 1995). Changes in the absolute number of guns in society, the availability of guns to juveniles, the increased firepower of today's firearms, and the attitudes towards the appropriate use of guns are factors that affect children and adolescents in our culture. Recent research has demonstrated that youth involvement in violence has been associated with the frequency of carrying a weapon (Resnick et al., 1997). Moreover, the increase in murders by juveniles in recent years in the U.S. has been tied directly to their use of firearms, particularly handguns (Blumstein, 1995; Fox, 1996; Kennedy, 1997; Snyder,



Sickmund, and Poe-Yamagata, 1997). Recent studies have also shown that juvenile homicide offenders like to equip themselves with newer and more powerful weapons (Kennedy, 1997), which they appear to be acquiring illegally from firearms dealers. The proliferation of guns in American society and the advent of firearms with increased firepower has been accompanied with a change in attitudes towards firearms. In past generations, youths were taught that guns were to be used for self-defense and/or hunting. In the 1990s, cultural messages embedded in music, television, and movies emphasize firearms as a symbol of power and the instrument to use to redress grievances, no matter how trivial.

## **Situational Factors**

The above discussion has suggested that youths growing up in the 1990s are more vulnerable to choosing antisocial means to resolve difficulties and fulfill needs because they live in a society where major institutions of socialization have declined. In addition, they are more vulnerable than their counterparts of the past to respond in violent ways because they are subjected to societal influences that are demoralizing and that also promote violence. Against this background are youths who are subjected to certain situations spared to others, which make particular children and adolescents even more vulnerable to behaving maladaptively. These are youths who are abused, neglected, raised in poverty, using drugs and/or alcohol, and involved in gangs. The prevalence of each of these situational factors has increased in the 1990s, meaning that the numbers of youths in the United States who are exposed to these conditions have also risen (Heide, 1999).

Many of today's youth grow up in families that foster violent and destructive behaviors. Despite a decrease in the number of young Americans, reports of child abuse have greatly increased in recent years (United States Advisory Board on Child Abuse and Neglect, 1993; Snyder, Sickmund, and Poe-Yamagata, 1997). Although the majority of children who are victims or witnesses of family violence do not grow up to victimize others (Smith and Thornberry, 1995), a growing body of research indicates that these children are at greater risk of engaging in delinquent behavior (see Heide, 1999). There is a growing body of evidence indicating that exposure to parental violence is also related to violent behavior (Thornberry, 1994; Howell et al., 1995; Heide, 1999). Some youths who are abused do not bond with others. Consequently, they develop no values or empathy to insulate them from killing innocent human beings. Other abused juveniles are angry and in pain, and vent their rage by destroying others (Magid and McKelvey, 1987).

Neglect frequently accompanies abuse, but it can also exist independently, often manifesting itself as the common failure of parents to supervise their children (Heide, 1992). During the last 25 years, several significant changes in family structures have contributed to decreasing levels of child supervision and have placed adolescents at greater risk of getting into serious trouble. These changes include a rise in the number of children born to single mothers, the increase in the number of children raised by a single parent due to illegitimacy or the subsequent divorce of the parents, and the increase in the number of working mothers (Heide, 1997). Given these familial changes, the time that youths spend with their parents and the amount of guidance that they

receive have significantly decreased during the past several decades (Carnegie Council on Adolescent Development, 1995).

The percentage of children living in poverty in the 1990s has also increased as a byproduct of the changes in family structure over the last two decades. The escalation in single-female-headed households occasioned by the rise in births to unwed females and in divorce has resulted in more children being raised in poverty (Garfinkel and McLanahan, 1986; Wright and Wright, 1995). Research indicates that about three out of four households headed by single females live in poverty at least some of the time and one third are chronically poor. As we approach the millennium, it appears that one out of every three children under age 6 lives below the poverty line (Stephens, 1997). The rise in the number of children living in poverty means that more children today have limited access to health care, including mental health services, and lack other resources to improve the quality of their lives. Some of these youths will fare well; others will cope maladaptively by engaging in criminal behaviors and by using drugs and alcohol.

Drug use surveys indicate that the rates of illicit drug use by adolescents, which had declined during the 1980s (Osgood, 1995; White House Office of National Drug Control Policy, 1997) are again rising in the 1990s, and are much higher than they were a generation ago. This increase has been observed among younger, as well as older adolescents ("Drug use up, study shows," 1997). The percentage of youths reporting past month use of marijuana, stimulants, hallucinogens, and inhalants rose from 1991 through 1994 (Office of National Drug Control Policy, 1995). A 1993-1994 survey of junior high (grades 6 through 8) and high school students (grades 9 through 12) conducted by the Parent Resource Institute for Drug Education (PRIDE) found a strong link in both groups between use of alcohol and marijuana and several measures of violent behavior, including carrying a gun to school and threatening to harm another person (Office of National Drug Control Policy, 1995). These findings are consistent with those from a growing number of studies indicating a substantial relationship between adolescent violence and substance abuse (See, e.g., Elliott et al., 1989; Johnston et al., 1993; Office of National Drug Control Policy, 1995; Osgood, 1995). Although using alcohol or drugs does not cause youths to commit crimes or be violent, it is likely that chemical abuse affects their judgment about engaging in criminal activity and their perceptions during the event. In addition, it is highly probable, in light of prior research, that the use of alcohol and drugs by many children and adolescents is "more a reflection of shared influences on a wide variety of deviant behavior than of any causal relationship" (Osgood, 1995, p. 32). Several researchers have found that various types of deviant or illegal behaviors are positively related to one another (See, e.g., Osgood et al., 1988; Elliott, Huizinga, and Menard, 1989; Gottfredson and Hirschi, 1990; Dembo et al., 1992; Resnick et al., 1997).

The numbers of gangs and of gang memberships have increased significantly during the last decade in the United States. Although most noticeable in large urban areas, gangs have also started to appear in suburban areas and smaller towns across America (Howell, 1994, 1995; U.S. Department of Justice, 1997). Substantial evidence exists that gangs have become increasingly responsible for a disproportionate amount of violence (See, e.g., Howell, 1995; Thornberry and Burch, 1997), which appears to be largely due to the ready availability of firearms and more

sophisticated weaponry (See, e.g, Block and Block, 1995; Sheley and Wright, 1995). The presence of gangs in schools, which almost doubled from 1989 to 1995 (U.S. Department of Justice, 1998), has also been associated with increased victimization in schools.

### **Youths at Higher Risk of Behaving Violently**

We have identified the social factors impinging on American youth today that make growing up in the 1990s more difficult for them than for children and adolescents growing up a generation ago. We have looked beyond the major changes in our institutions and societal influences to situational factors that affect some children in the United States and consequently put added strain on them. The question becomes, can we do better at isolating the youths who are most vulnerable to behaving violently in society? The number of school shootings, and even the number of juvenile homicides, is far too small to predict which youths will respond in such a fashion. However, my clinical experiences evaluating approximately 100 violent adolescents, mostly murderers, suggest that the possession of certain personality characteristics, particularly when combined with involvement in certain types of activities, put youths at higher risk of choosing violent solutions.

I have frequently observed certain personality characteristics present in the case histories of youths who engage in homicidal behavior. These include low self esteem and an inability to deal with strong negative feelings. These youths are often angry, depressed, alienated from mainstream society, and chronically bored. Their judgment is poor and their behavior is impulsive.

These personality characteristics are not necessarily indicative of youths who will behave violently. The "ante" is raised, however, when these youths are drawn to nihilistic activities and become heavily involved in them. Youths who are preoccupied with fantasy games, such as Dungeons and Dragons, can blur fantasy with reality. Those who become extremely involved in cult and fringe groups that promulgate separation and hate may come to see "outsiders" as the enemy or as inferior human beings that are expendable. Kids who become absorbed in violent media (movies, music, videogames) and are obsessed with acts of dying and destructiveness are aligning themselves with destructive and violent themes. Children and adolescents who are cruel to animals and to more vulnerable human beings (younger children, smaller kids, the mentally ill, homeless people, elderly adults) are displaying sadistic behavior that warrants concern. Youths who are drawn to malignant acts of aggression lack empathy and may see death and destruction as the means to achieve power and control and to fulfill other existential needs in maladaptive ways (Fromm, 1973).

### **The Cumulative Effect in Context**

In summary, changes in major institutions, societal influences, and situational factors affecting some children in the 1990s appear to be significant factors influencing the behaviors of youths,

including those who resort to violence. These variables likely interact with the personality characteristics of particular adolescents, making some youths more likely to engage in violent behavior than others.

In essence, for many youths, the effect of these factors is cumulative. Put succinctly, many youths growing up in the 1990s feel that they have little or nothing left to lose. These are the kids who are angry, frequently in pain, and often unattached to other human beings due to experiences in their home and neighborhood environments. Many of these youngsters lack self-esteem and the resources to improve their lives. They are living in a society experiencing increases in youths having sex and babies outside of marriage (Friedman, 1992), using drugs, participating in criminal violence, and dying violently whether through homicide or suicide. As a result, many young people today are severely alienated (Lerner, 1994). They do not hold conventional values or dreams. Often chronically bored, they use drugs, alcohol, and sex to numb themselves and commit crimes for fun. They live in the moment. To them, thrills -- and lives -- are cheap.

Biological factors also may be intricately entwined in the homicidal equation in many cases. A growing body of research suggests that criminal behavior may be linked at least in some cases to genetics, neurological factors, and biochemical reactions (Widom, 1991; Lewis, 1992; Pincus, 1993; Heide, 1999).

Sociobiologists have maintained that criminal behavior is influenced by both individual biological factors and social and environmental conditions (Jeffrey, 1979). Lewis's extensive studies on juvenile murderers led her to conclude that genetic factors and biological vulnerabilities, particularly when severe, predispose certain individuals to respond violently. Her research suggests that if these individuals are subjected to intense psychological, social, and environmental stressors that exceed their ability to cope, violent expression is more likely to result, particularly among males (Lewis et al., 1989; Lewis et al., 1991; Lewis, 1992). Lewis' theory of neuropsychiatric vulnerability also received support in a larger study involving urban delinquents in Chicago (Hughes et al., 1991).

What can be done to reverse the upward surge in violence by today's juveniles? Neutralizing or eliminating the variables that contribute to youths becoming involved in violent incidents may require a generation or more to accomplish (Heide, 1999). My clinical experiences with violent youths have convinced me that change must include parents, the educational system, communities, government leaders, medical and mental health professionals, the media, and individuals joining together to raise a healthier next generation and to build a more peaceful society. I will provide a blueprint to reduce youth violence in the United States during my talk on Friday. (This paper is contained later in these proceedings.)

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## Session 1: Essentials of Violence Surveillance Data

### Responses by Lois Fingerhut

*What's the difference in the mortality vs. morbidity e-codes for injuries by firearms?*

**Lois:** The code structures are basically the same, the question is how they're used. They're generally a pretty good match.

*What about the sibling crime idea, questions on homicide as the outcome of something else? So these e-codes, since they don't reflect specific crimes, can't be used to trace sibling crimes?*

**Lois:** The forms only have good information on this if the physician puts the description of how the event happened on the form. The ICECI, a new classification coding from Injury Violence has a very detailed violence module which might help.

*My experience using ICD-9 was difficult, it was hard to access firearms data from this.*

**Lois:** ICD-10 is even harder. Using CDC Wonder (interactive software) it's pretty simple, however, to get to any mortality data.

*Do the differences in ICD-10 provide for better descriptions of types of firearms?*

**Lois:** It is better in ICD-10, but is still not complete.

*Are there materials for doing historical analysis?*

**Lois:** Yes, there are materials on which the codes are comparable to each other across time.

*How do you determine "undetermined intent"?*

**Lois:** When there isn't enough information to classify, we classify as undetermined intent.

*How good are the surveillance systems on mortality and morbidity for looking at homicide and lethal violence?*

**Lois:** Better than they were. For example, in the emergency room data, very often due to malpractice and confidentiality issues, information on intent does not get into the record. But, there is a big movement to get ER personnel to enter the full information. The national data aren't the best source or the most ideal source, but they are all we have access to. I think it will be a good source eventually on lethal data. There is more money going into the training of

individuals for coding on these items, much more extensive training for physicians. Physicians have to become convinced that prevention is part of their job.

*Regarding discharge data - this discharge data is only overnight. In New York state, if someone doesn't stay overnight they weren't considered a discharge.*

**Lois:** I will check on that.

**Hargarten:** Increasingly, people are not even being admitted. They are being observed for 8, 10, or 22 hours but not admitted, so researchers need to look carefully at state data. And, having practiced in an ER, it is very hard to get information in the ER on the incident. The Crash Outcome Data Evaluation made links between medical and law enforcement data. That's an exciting possibility, since there are inherent limits to hospital or morbidity data.

*When you have information on children, do you also have data on parents?*

**Lois:** Not from what we have in the mortality or morbidity data, we might have that in the National Health Interview Survey.

*What's available on tape versus CD-ROM?*

**Lois:** Everything on data tapes is available on CD-ROM. I haven't used the CD-ROM, but my understanding is that the level of the data on the CD-ROM is the same. I understand you can get these free from ICPSR, if not call or e-mail me to get them.

*Are there specific reliability issues regarding child homicides?*

**Lois:** In the details on cause it may be a problem. Child abuse is underrepresented on death certificates. Much more is reported in other sources.

# **Injury Surveillance Using Data From the National Center for Health Statistics**

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## **Abstract**

The mission of the National Center for Health Statistics (NCHS) is to provide statistical information that will guide actions and policies to improve the health of the American people. Many of the data systems at NCHS can be used for injury surveillance. Most of these collect reliable data that are E-coded. In this presentation, I will explain what is meant by national injury surveillance and why E-codes are crucial for good surveillance. In addition, the individual data systems will be explored in terms of their strengths and weaknesses for injury surveillance. Detailed information on data availability and documentation can be found on the NCHS home pages: <http://www.cdc.gov/nchswww/>.

## **What is an injury surveillance system and why is it important?**

Very broadly and very simply, a surveillance system is a data driven system that continually or periodically collects information and data for a particular purpose. In this case we are focused on injuries - optimally the system will be able to be used to describe the circumstances, the person injured, the timing, the location and perhaps most importantly both the diagnosis of the injury and the external cause of the injury. The external causes of injury are most often identified in the data classification system by the World Health Organization's internationally accepted classification scheme, the International Classification of Disease. Currently, the Ninth revision is in use in this country. The chapter of the Ninth revision of the ICD on the external causes is commonly referred to the E-code chapter.

## **Why are E-codes important for surveillance?**

E-codes help identify and prioritize injury problems. E-codes provide information about both the event during which the injury took place and about the individuals who were injured. When used correctly, E-codes recreate a picture of the specific circumstances of an injury including the "how" and the "where" the event occurred. (Children's Safety Network, 1998)

Value of E-codes: [based on unpublished material prepared by State of Minnesota]

- 1-Calculating costs associated with treatment of injuries related to specific causes
- 2-Development of community education programs to address injuries from particular causes
- 3-Evaluation of impact of local laws and regulations
- 4-Health system planning for program development
- 5-Identification of patterns in injury

The data that are captured with E-codes are used to measure trends, detect patterns and identify risk factors for injury. The data systems can be national, state or local. My role this morning is to focus on national systems.

My remarks are limited to national data systems from the NCHS- despite the fact that there are many other national sources for injury data . First and very importantly, NCHS data systems are designed to be useful as general purpose surveillance tools. Injury is but one component, and quite frankly, a small one, but an exceedingly important one. There are different ways one can classify NCHS surveillance systems, and for the purposes of this presentation, they will be dichotomized into ones that collect data on mortality vs. those that collect data on morbidity.

There are fundamental differences between E-code guidelines for mortality vs. those for morbidity.

**Mortality:**

- Single event
- Underlying cause
- Single code
- Explains death event
- "Undetermined" intent requires official confirmation
- No updates in between revisions

**Morbidity:**

- Multiple episodes of care/different settings
- Refers to proximal/principal diagnosis
- Multiple codes
- Explains cause of injury
- "Undetermined" defaulted-unintentional (pre-10/96)
- Annual updates

An example: An elderly female "accidentally" falls down the stairs and strikes her head on the wall. If she dies, the E-code on the death certificate is for an "Unintentional fall" as the fall was the underlying cause or initiating event. The injury to her head will be included on the death certificate, not as the underlying cause, but as a contributing cause. It will be coded from the death certificate but can only be found on the multiple cause of death data tapes. If she survives the fall and is taken to the emergency room, the principal diagnosis is related to her head injury and the relevant E-code on the medical record is for "striking against an object," as that is the proximal cause. If the information on the certificate is questionable as to the intent of the fall, that is if it could not be determined that the fall was unintentional or intentional (as in she was pushed), the code would be for a fall of undetermined intent. Until October 1996, the emergency department record would have been coded to unintentional as there was no code guideline allowing for undetermined intent; the default was to unintentional. For official morbidity coding guidelines, see: <http://www.cdc.gov/nchswww/datawh/ftpser/ftpicd9/ftpicd9.htm#guide>.

## **Mortality**

### **E-code guidelines**

Use an E-code for the underlying cause when the morbid condition is classifiable to ICD-9 800-999; assign E-code to initiating event (except when initial event was "trivial" leading to a more serious injury or if initial event was a slight injury (one that rarely causes death)).

"Accident" due to disease condition: when a disease condition such as heart attack or alcoholism is indicated as the underlying cause of the injury event (accident), code to the injury event unless there is evidence that the death occurred prior to the event with few exceptions (one of which is accidents resulting from epilepsy).

For more detail, see: Instructions for Classifying the Underlying Cause-of-Death, 1992, at <http://www.cdc.gov/nchswww/about/major/dvs/im.htm>.

### **National Vital Statistics System**

The National Vital Statistics is used by most people to describe the epidemiology of injury mortality in this country. While most NCHS data systems are sample based, the national vital statistics system is universal in its coverage. NCHS mortality data can be analyzed at least 3 levels: national, state and county level surveillance. In the decentralized vital statistics of the U.S., death certificates are legal and statistical documents of the states, not of the Federal government. Some degree of standardization in the structure and content of the various death certificates used by the states is achieved by their willingness, for the most part, to adhere to a "model" certificate promulgated by NCHS.

### **Death Certificates**

In the United States, two persons complete the information on the death certificate. The bottom half of the certificate is the medical certification of death which is completed by the attending physician, and in the case of injury generally by a medical examiner, or coroner; and the top half, which contains the demographic information, is completed by the funeral director, who also has the ultimate responsibility for filing the certificate with the appropriate state registration officials, who are custodians of the original records. The state registration officials also have the authority and responsibility to conduct queries for questionable or incomplete information (such as follow up for death whose cause is pending investigation), or where the particulars of an 'accident' or injury are not adequately described.

For injury-related deaths, the U.S. Standard Certificate of Death has a number of items including the date and time of the injury, whether the injury occurred at work, a description of how the injury occurred, the place of injury, and the actual street location of the injury. Clearly, the death

certificate is a potentially rich source of statistical information on injuries. It is also instructive to note what the standard death certificate does not ask regarding injuries. It does not, for example, ask explicitly about drug or alcohol involvement; and it does not clearly specify the degree of detail that is acceptable when describing how the injury occurred. Moreover, it does not include prompts specific for accidents that would encourage the medical provider to provide useful information in an automobile accident for example as to whether the decedent was the driver or a passenger.

Definition of underlying cause of death:

The disease or injury which initiated the train of morbid events leading directly to death, or the circumstances of the accident or violence which produced the fatal injury.

Additional detail on the National Vital Statistics System can be found at:  
<http://www.cdc.gov/nchswww/about/major/dvs/mortdata.htm>.

#### National Mortality Followback Survey (NMFS 1993):

The 1993 survey samples individuals aged 15 years or over who died in 1993. Forty- nine of the 50 State vital registration areas granted approval to sample their death certificates, as well as the independent vital registration areas of the District of Columbia and New York City. (South Dakota declined to participate in the NMFS due to State law restricting the use of death certificate information.) A sample of 22,957 death certificates from the Current Mortality Sample was drawn. To meet specific research needs, the sample included 9,636 death certificates selected with certainty. There is an over-sample of death certificates to obtain reliable numbers for important population subgroups; persons under age 35, women, and the black population.

The 1993 NMFS focused on five subject areas:

- Socioeconomic differentials in mortality
- Associations between risk factors and cause of death
- Disability
- Access and utilization of health care facilities in the last year of life
- Reliability of certain items reported on the death certificate

The 1993 NMFS is different from the five previous mortality followback surveys in several ways. It emphasizes deaths due to homicide, suicide, and unintentional injury. The subject areas are considerably broader. However, many previously-surveyed subject areas are included for trend analysis. The survey is the first to acquire national-level information from medical examiners and coroners. The complexity of the questionnaire necessitated telephone or in person interviews.

The 1993 NMFS was designed in collaboration with other agencies of the Public Health Service, Department of Health and Human Services, and the National Highway Traffic Safety

Administration. Several of these agencies provided funding through NCHS's Reimbursable Work Program. Results from the first release of data from the 1993 NMFS are available on the FTP server.

Additional detail on the survey can be found at:  
<http://www.cdc.gov/nchswww/about/major/nmfs/nmfs.htm>.

### **General Mortality Issues:** (Rosenberg and Kochanek, 1995)

#### Completeness of Death Certificate Information

Completeness of reporting is a critical element in the effective use of death certificate information for injury prevention and control. For example, it is important to know who the person injured is in motor vehicle injuries, and to completely specify falls, and the type of weapon when a firearm is the cause.

How can this be addressed? For one thing, *better education of medical certifiers* is needed on how to complete the death certificate. NCHS has initiated a number of efforts directed at physicians to improve cause-of-death reporting beginning with two national workshops, one in 1989 and the other in 1991. These initiatives are continuing. A second approach to addressing this problem is *querying at the state level*. Death certificates with incomplete information on injuries should not be permitted to pass to the stage of processing without asking the medical certifier for sufficiently complete information to make it useful for injury surveillance. These initiatives need to be national in scope if they are to result in good information on which to base injury prevention programs.

#### Information Augmentation

It needs to be recognized that even if all the items on the death certificate were answered completely and accurately, there would still be need for additional information on injuries that is not routinely captured on the death certificate, or, if captured, not in a standard, uniform, and dependable way. Examples include whether drugs or alcohol may have been involved in the accident. Without a direct question to the certifier asking about substance abuse, one can expect as many studies have shown that the impact of substance abuse on injuries cannot be adequately measured using information on the standard death certificate. Additional information from another source is needed to *augment the information routinely collected* on the death certificate.

What kinds of augmentation are possible? One type is what NCHS calls "follow back" surveys. These are surveys using death certificates as a sampling frame that can be used to get additional information on deaths for a special subset of the decedent population, based on demographic characteristics or on causes of death. The 1993 National Mortality Follow back Survey (NMFS) was designed to provide national estimates of important characteristics of the 2,218,940 people

aged 15 years and older who died in 1993. Last conducted in 1986 (21); the National Mortality Follow back Survey focused on obtaining socioeconomic information such as income, and information on health care in the last year of life.

Another approach to augmenting information reported on the death certificate is by *linking information reported on the death certificate with that from another source*. For example, the 1993 national mortality follow back survey includes a component to link with abstracts of coroner/medical examiner records. This will not only augment information on the death certificate but will also be a useful basis for checking the reliability of the cause of death reported by the same medical examiner or coroner who completed the death certificate.

The death certificate can be linked to a variety of other sources including hospital records, health examination survey records, health interview records, and administrative records -- each of which can potentially enrich the mortality data base for injury research.

### Validity and Reliability

The question of validity and reliability is one that suffuses information from the vital registration system. The death certificate, and in particular cause of death, is always a prime suspect in these investigations. Many studies have been published on the validity of cause of death reflected in the NCHS annotated bibliography of 128 such studies carried out over a period of 23 years, with an update published in 1991.

Some of these studies raise troubling questions regarding the medical certification of death, but these have been largely in the area of natural causes, or deaths related to disease processes of relatively long duration. For injuries, the cause of death tends to be more clear-cut and immediate in its fatal action. Nevertheless, *questions of validity do often arise regarding manner of death, that is, whether the injury was accidental, suicidal, or homicidal*. Only in-depth studies can shed light on this, and, even in some cases, the basic records will not reveal what the medical certifier has chosen not to report.

E-coded mortality data are useful to the extent that they reflect accurate, specific information about the circumstances surrounding the fatal injury-causing event that are recorded on the death certificate. The specificity of these data could be improved by:

- encouraging greater specificity in reporting and avoiding use of generalized codes, such as "fracture, cause unspecified", "unspecified accident" and "assault by unspecified means;"
- providing sufficient narrative detail in the item "how the injury occurred" on the death certificate in order to enhance the information on the cause-of-death section of the certificate. It is particularly important to identify when an agent (e.g., consumer product,



type of motor vehicle) is involved in an injury, as well as specific information about the agent and the injury scenario, since that information is not routinely captured in the E code.

- educating medical certifiers about the usefulness of E-coded mortality data. (McLoughlin, Annest, Fingerhut, et. al., 1997)

### **ICD 9 vs. ICD 10 for mortality** (Fingerhut, Rosenberg, Kochanek and Pickett, 1998)

The United States will begin coding its national mortality data using ICD-10 beginning in 1999. Major changes have been made from ICD-9 to ICD-10 in terms of both diagnostics codes as well as external cause of injury codes. For example, the external cause of injury codes are no longer a supplementary chapter of the ICD. All ICD chapters are divided into an alphanumeric coding scheme of one letter and two numbers at the 3-digit level with decimal subdivisions for the 4th digit. Codes for external causes of injury are found in Chapter 20 and use letters V, W, and X- and thus are definitely not "E-codes". Injury diagnostic codes are found in Chapter 19 and use letters S and T. The codes in ICD-10 are multi-axial in concept, in that there are requisite codes for injury incidents for place of occurrence and for activity the victim was involved in when the death occurred. Transportation related mortality codes have undergone a major revision. The letter "V" is used for transportation related injuries with the first subdivisions being for the victim's mode of transport (for example, pedestrian, occupant, pedal cyclist); the third character identified the victim's counterpart or the circumstance of the accident (collision with vehicle, noncollision). The fourth character identifies the activity of the victim (driver, passenger) and whether the incident occurred in traffic or a non-traffic situation. Other examples of significant changes in this chapter: "fracture not otherwise specified" which was classified with Falls in ICD-9 is now classified with "exposure to unspecified factors". Homicide codes will now include more detailed codes for abuse, neglect and abandonment and contain codes for perpetrator. Late effects codes are now combined in one section rather than being placed with relevant sections of unintentional, suicide or undetermined intent.

### **Morbidity**

#### **National Surveys:**

##### **National Hospital Discharge Survey**

In this survey, data are collected from a sample of records from a sample of hospitals. In 1995 data were collected for about 263,000 discharges from 466 hospitals. Data from this survey can be used to make national estimates of hospital discharges. The injury diagnostic information that is derived from this survey related primarily to the diagnosis, that is ICD 9 CM codes 800-999.

In 1994, only about half of the medical records for which an injury was the principal diagnosis had an accompanying E-code.- This proportion has increased remarkably to 64% in 1996 as the

number of states mandating e-codes has increased. *Information is likely in the detailed patient record but not on the summary face sheet from which the abstract information is gathered.*

Hospital records are for identification of severe nonfatal injury discharges not people. There can be multiple discharges for the same person.

For more information on the survey, see:

<http://www.cdc.gov/nchswww/about/major/nhcs/nhcs.htm#nhds>.

### **National Hospital Ambulatory Medical Care Survey (NHAMCS) Emergency Department component**

NCHS also conducts a family of surveys related to outpatient care. The one that is most useful for injury surveillance is the NHAMCS that was begun in 1992. In this survey, both ICD codes for injury diagnoses as well as for external causes of injury can be captured. In this survey, information is abstracted for a systematic random sample of visits during a randomly assigned 4-week reporting period.

In 1995, patient record forms were completed for 22,000 visits to the emergency department and for 28,000 visits to outpatient clinics. Overall, injuries represented about 40% of visits to the emergency department; approximately 85-90% of those visits had an associated E-code.

For more information on the survey, see:

<http://www.cdc.gov/nchswww/about/major/ahcd/ahcd1.htm>.

For detailed injury data from the NHAMCS-ED, see:

[http://www.cdc.gov/nchswww/products/pubs/pubd/series/sr13/pre-131/sr13\\_131.htm](http://www.cdc.gov/nchswww/products/pubs/pubd/series/sr13/pre-131/sr13_131.htm).

### **National Health Interview Survey (NHIS)**

Historically, the NHIS has not been a rich source of data on cause of injury. Data were collected in a national sample of households on conditions that either caused some kind of restricted activity or resulted in medical attention. These are the injuries at the base of the injury pyramid. Beginning in 1997, the core questions of NHIS were redesigned including an entire section on injury- including the verbatim text of how the injury occurred. There are as yet no data, but we are looking forward to seeing some preliminary results in the next few months.

For more information on the survey, see:

<http://www.cdc.gov/nchswww/about/major/nhis/nhis.htm>.

### **State role in Morbidity Surveillance**

While E-codes for mortality have more or less been taken for granted in this country and elsewhere, E-codes for morbidity are considerably rarer, although things are improving quickly.

As of this year, 34 States and the District of Columbia have been collecting statewide hospital discharge data with cause of injury coding as a part of each record. Fewer have systems that are based on emergency departments. A survey was conducted and completed recently that polled states on the kinds of external cause injury data they were collecting. Highlights include: Approximately 80% of states have a statewide Hospital discharge data system. Most of those routinely collect some level of E-codes. Not all, however, collect them as part of a mandate. RI and Wash were the first states to mandate E-coding in 1989; most other states implemented in the early 1990's. (APHA, 1998)

There is a fair amount of variation across States in the level of detail collected. Fewer states (12) have ED systems and 11 routinely collect some level of E-codes. State role- number of states has been increasing rather sharply during the 1990's.

### **General morbidity data quality issues**

The issues of concern with regard to E-codes that I spoke of in terms of mortality are equally relevant for morbidity: completeness of the information (better education of medical certifiers; of hospital personnel); instead of querying at the state level - query at the hospital level; augment the information routinely collected by, for example, linking information reported on the hospital record with that from another source (for example emergency medical services records)

### **ICD 10 CM (Fingerhut, Rosenberg, Kochanek and Pickett, 1998)**

The clinical modification is due to be implemented in 2001. The current draft of ICD-10-CM contains a significant increase in the number of codes over ICD-10 and ICD-9-CM. Notable improvements in the content and format include: the addition of information relevant to ambulatory and managed care encounters; expanded injury codes; the creation of combination diagnosis/symptoms codes to reduce the number of codes needed to fully describe a condition; the addition of a sixth character; incorporation of common 4th and 5th digit subclassifications; laterality; and greater specificity in code assignment. The new structure will allow further expansion than was possible with ICD-9-CM. In ICD-10, and more importantly in 10 CM, the external cause of injury codes are no longer a supplementary chapter of the ICD.

ICD-9 was often criticized for its single axial approach to external causes of injury as it was not very effective for injury prevention initiatives. In ICD-10 and 10-CM there are requisite codes for all fatal and nonfatal injury incidents for place of occurrence and for the activity the victim/patient was involved in when the injury occurred. Transportation-related ICD codes have undergone a major revision to focus on the victim and the type of vehicle involved, rather than the other way around; the letter "V" is used for transportation related injuries with the first subdivisions being for the victim's mode of transport (for example, pedestrian, occupant, pedal cyclist); the third character identified the victim's counterpart or the circumstance of the accident (collision with vehicle, noncollision). The fourth character identifies the activity of the victim (driver, passenger) and whether the incident occurred in traffic or a non-traffic situation. Other examples of significant changes in this chapter: homicide/assault codes will now include more

detailed codes for abuse, neglect and abandonment and contain codes for perpetrator; and late effects codes are now combined in one section rather than being placed with relevant sections of unintentional, suicide or undetermined intent.

Diagnosis codes have also been revised; the major subdivisions for diagnosis codes are by body part rather than by type of injury as in ICD 9. For example, they are for head, neck, hip and thigh, knee and lower leg- rather than fracture, open wound, or superficial injury. Each of these type of injury categories is specified with body part.

In ICD-10 CM, poisoning codes have undergone a major change in that there will no longer be external cause codes; rather the intent (unintentional, suicide or undetermined) will become an additional digit to the poisoning diagnostic codes. ICD 10 CM will contain many more codes than ICD 10 for mortality.

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# **On Intimate Partner Homicides in Massachusetts**

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## **Abstract**

The FBI's Supplementary Homicide Report (SHR) is often used by researchers to study intimate partner homicide since it is the only national data source that includes information on the victim-offender relationship. One problem confronting these studies is the extent of missing data in the SHR, meaning that information on intimate partner homicide incidence is incomplete.

The current study examines the extent of this problem in Massachusetts over a five-year time period. Multiple data sources were used to construct a database of all intimate partner violence-related homicide (IPVH) cases in Massachusetts from 1991 through 1995. These data were compared with the SHR for the same time period. Results show that the SHR identified only 71.1% of the intimate partner victims, incidents involving multiple victims were vastly underreported in the SHR during these years, and cases involving unmarried former partners were less likely to be reported as partner homicides in the SHR. An evaluation of one methodology designed to adjust for flaws in the SHR showed that adjusting the SHR data on intimate partner homicides using this methodology overestimated the actual rate of intimate partner homicides during the study years.

## **Background**

Numerous studies of intimate partner homicide have been conducted, many of which have documented national trends. These studies employed the only national homicide data source that includes information on the victim-offender relationship, the Supplementary Homicide Report (SHR) (Browne & Williams, 1993; Bureau of Justice Statistics, 1994; Fox, 1994; Mercy & Saltzman, 1989; Plass, 1993; Straus, 1986). While the SHR has important strengths, particularly the collection of homicide data nationally and the inclusion of the victim-offender relationship, some investigators have described shortcomings of the SHR system and cautioned against uncritical use of the data. Because it is a voluntary system, some law enforcement agencies do not take part in the UCR system and therefore some homicides are never reported (Williams & Flewelling, 1987). Even those agencies that do participate sometimes fail to submit reports for a given month, and the extent of this nonreporting may vary across agencies and types of cases. In addition, homicides tabulated by the UCR may not be followed up by a SHR form, which is revealed in the slight discrepancy between the number of homicides reported by the UCR and SHR (Brewer, 1993; Williams & Flewelling, 1987). In addition, there is substantial missing data on victim-offender relationships within reported SHR cases, which limits detection of intimate

homicide cases. Some investigators have compensated for the limitations of the SHR, or indeed of any single data collection system, by using multiple data sources to ensure identification of the greatest number of homicide cases and to increase the amount of contextual information collected (Keppel & Weis, 1992; Rand, 1993). The current study uses multiple data sources to identify and characterize intimate partner violence-related cases. In so doing, an attempt was made to detect the maximum number of cases and compile detailed data about the circumstances of each homicide.

## **Method**

### **Data Sources**

A victim-based database of all partner homicide cases from 1991 through 1995 was compiled from news articles, Supplementary Homicide Reports, lists assembled by District Attorney's offices, and reports from domestic violence advocacy agencies. This database will be referred to as the "study database." Because SHR reports do not contain names, cases identified through the SHR were matched with death certificates to identify individuals by name. The study database is intended to capture all cases of Massachusetts residents killed in IPV-related incidents from 1991 through 1995. Five out-of-state residents were killed in IPV-related incidents in Massachusetts during the five-year study period, and these cases are excluded from the present analysis. Our sample does include four Massachusetts residents killed in adjacent states. There may have been Massachusetts residents killed in IPV-related incidents in more distant locations, but we did not identify any cases of this nature.

### **Data Analysis**

The study database was compared with SHR files to examine the number and types of IPV-related cases that are unreported or miscoded in the SHR. First, we compared the number of Partner Victims in the study database with the number of Partner Victims reported in the SHR. Cases in the study database were then individually matched to SHR cases using city and county; victim-offender relationship; victim's age, race, and sex; offender's age and sex; and weapon. Although SHR records always contained data on the city, month, and year of the homicide, at times missing victim or offender data in the SHR made it difficult to establish a definitive match. In those instances, we compared the SHR record with the full list of death certificates to determine whether the SHR case could conceivably be a match for a different homicide case. If there was no other homicide case among the death certificates that matched the SHR record, it was assumed to be a match for our case. Finally, we compared the number of multiple victim homicides found in the study database with the number reported in the SHR. Note that the SHR files were also used to help detect cases, so these analyses do not compare the completeness of other sources with that of the SHR. Rather, we are comparing a list compiled from all available sources (as close to 100% case finding as we could accomplish) with the SHR files.

We also evaluated one methodology that has been developed to adjust for known flaws in the SHR. Williams and Flewelling (1987) created a methodology to compensate for unreported

cases and missing data when calculating homicide rates based on the SHR. To adjust for nonreporting agencies, a weighting factor is calculated based on the difference between the FBI's overall victim count in the UCR and the number of victims reported in the SHR. To compensate for missing victim-offender relationship data, Williams and Flewelling suggest two possible procedures whereby the homicide rate can be adjusted by extrapolating the characteristics of the known data to the unknown cases. Both procedures involve starting with the number of intimate partner homicides among the cases in which the victim-offender relationship was reported and then adding a percentage of the cases in which the victim-offender relationship was unknown. The rate is then calculated based on the estimated total number of intimate partner homicides among cases with both known and unknown relationships. We applied these procedures to the SHR for 1991-1995 intimate partner homicide cases and compared them to the rate of Partner Victims only (excluding Other Victims) calculated from the study database. We applied these procedures to the SHR for 1991-1995 intimate partner homicide cases and compared them to the rate of Partner Victims only (excluding Other Victims) calculated from the study database.

## **Results**

### **Comparison of Study Database With SHR**

There were 149 Partner Victims killed during the five year period, with a range from 25 to 40 victims per year. A comparison of the study database with the SHR shows that, compared to the 149 Partner Victims in the study database, the SHR reports only 106 (71.1%) of the Partner Victim cases in our study. Examining the yearly data reveals that the SHR data steadily improve over the 5-year period, from reporting 56.0% of intimate partner cases compiled in the study database in 1991 to reporting 85.0% of these cases in 1995. Despite the improvement, in every year the SHR underestimates the true number of victims, which suggests that the problem with underreporting in the SHR is persistent.

We then examined each case in our study to determine whether there was a corresponding case in the SHR. Each one of our cases was classified as "matched" (matched an SHR case and the victim-offender relationship recorded there was correct), "miscoded" (matched an SHR case but the victim-offender relationship was not coded there as a partner relationship), or "unreported" (no SHR case matched the victim, offender, and incident information in the study database.) In some cases, the victim-offender relationship was coded differently than our record but did indicate an intimate partner relationship (e.g., a relationship that we had coded as "girlfriend" was coded "wife" in the SHR.) For this analysis, a relationship was only considered miscoded if we had recorded the victim-offender relationship as an intimate partner relationship but the victim-offender relationship of the matching SHR case was coded as a non-partner relationship.

Of 149 Partner Victim cases, 59 (39.6%) were either unreported or miscoded in the SHR. This number is larger than the discrepancy of 43 cases reported above, due to erroneous and duplicate entries in the SHR, plus intimate partner homicide cases in the SHR that did not meet our inclusion criteria. These errors result in an inflation of the SHR totals.

Of the 59, 34 cases (22.8% of Partner Victim cases) had no match in the SHR. In 25 cases (16.8% of Partner Victim cases), the relationship was coded as a non-intimate relationship. Therefore, these cases would not be identified in an analysis using SHR data that counted intimate partner homicide victims based on victim-offender relationship. Examination of the actual coding of the 25 miscoded cases reveals that, in the majority of cases, the incorrect relationship was recorded as "unknown" (n=10) or "acquaintance" (n=7). The remainder were coded as "other known" (n=4), "friend" (n=2), and "daughter" (n=2). The two cases in which partners were coded "daughter" results from a systematic problem in multiple victim homicide data.

Examining the unreported cases more closely reveals that these cases often occurred in smaller jurisdictions. Of 34 unreported cases, 21 (62%) occurred in cities with populations less than 30,000. These communities may not have full-time law enforcement personnel and agencies may not be familiar with reporting procedures, as homicides occur less often in these localities. In contrast, larger jurisdictions were more likely to report cases with miscoded victim-offender relationships. Of the 25 miscoded cases, 72% had occurred in cities with populations greater than 90,000, with the majority of these cases being reported by Boston.

We investigated the coding of different types of relationships in the SHR to determine whether certain relationships were more likely to be miscoded. These data show that, among cases that were reported in the SHR, ex-girlfriends and ex-boyfriends were coded as intimate partners 59% of the time, while current boyfriends and girlfriends were coded as intimate partners 83% of the time. These findings should be interpreted with caution, due to the fact that they are based on a relatively small number of cases, but they do suggest that the absence of codes for ex-girlfriend and ex-boyfriend in the SHR may contribute to the problem of miscoding. There was also a higher proportion of unreported cases among ex-girlfriends and ex-boyfriends (39%) than among current girlfriends and boyfriends (16%).

### **Statistical Adjustment for Non-Reporting Agencies and Missing Data**

The five-year rate of intimate partner homicide based on the study database (the "true" rate) is 3.10 per 100,000 persons. Calculating this same rate based on SHR reports, without using any adjustment procedures, yields a five-year rate of 2.45 per 100,000 persons, an underestimate of the true rate. Application of Williams and Flewelling's first adjustment procedure results in a five-year rate of 5.02 and the second adjustment yields a figure of 5.75 per 100,000 persons, both of which overestimate the true rate substantially.

### **Multiple Victim Homicides**

Many studies using the SHR exclude multiple victim homicides because investigators theorize that these events are different from single victim incidents and constitute a very small proportion of cases. We examined the reporting of multiple victim homicides in Massachusetts during the



study years. Our data show that 15 of 175 incidents (8.6%) had more than one victim. There were 34 victims in these 15 incidents (18% of the total 194 cases). The SHR for the same time period reports only 4 incidents involving 9 victims.

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# **An Evaluation of the Completeness and Accuracy of SHR Data in Chicago, 1993 and 1994**

## **HRWG 1998 Intensive Seminar**

Thomas D. Patterson, Daniel Dick and Carolyn Rebecca Block  
Illinois Criminal Justice Information Authority

Discussant: Margo Wilson, McMaster University

At the request of the Bureau of Justice Statistics, the Illinois Criminal Justice Information Authority conducted a case-by-case comparison of homicide cases in the Supplemental Homicide Reports to Chicago Homicide Dataset cases booked in 1993 or 1994, the SHR Quality Project. This project posed two methodological challenges, database organization and comparative analysis. Now it has been completed, however, the results provide information about the quality of SHR data in Chicago, and by extension, in other cities with similar situations. This presentation will review the methods and the results.

Chart 1 is a schematic overview of the method we used for case-by-case matching, given the constraint that the SHR files did not contain an ID number. Using key variables and an intermediate-stage "Transfer" file, we were able to match each of 1,750 victim records in the Chicago Homicide Dataset (CHD) with one and only one SHR victim record (Chart 2). These 1,750 records accounted for 1,674 separate incidents.

With the 1,674 matched cases, we were able to look at missing and incomplete information in the SHR, relative to the CHD. Some key results regarding missing offender information are in Table 4.12. The 93 incidents with missing offender information differed significantly from the 1,581 in which offender information was not missing in mean offender's age (slightly younger), offender's gender (male), weapon (more handguns), gang motive (more victims were a rival gang member and more motives were a gang altercation). However, there was no significant difference in the race/ethnicity of the offender or in the time lag between injury and death.

Although CHD cases missing completely from the SHR differed from those that were not missing in that almost all of the missing cases had a lag time between injury and death, this was not true of the homicides in which the case was present in the SHR but the offender information was missing. However, the 93 offender-missing cases were significantly more likely to have a lag between the date of injury and the date of arrest. This suggests possibilities for improving the quality of SHR data.

**Chart 1, "Variables Used to Match Cases at Stage 1 and Stage 2," is not available in this graphic version.**

**Chart 2, "Homicide Cases in CHD, Transfer and  
SHR Datasets; Cases Matched and Cases Not Matched," is not  
available in this graphic version.**

**Table 4.12, "Comparing 93 First Offenders Missing in SHR to First Offenders Present in SHR Incidents Using Difference of Means Tests on Relevant Variables," is not available in this graphic version.**

## **The Surveillance Value of "Bad" Data: Using Obliterated Serial Number Data in a Firearm Surveillance System**

Bill Sherlock, Illinois State Police

David Kriegbaum, Bureau of Alcohol, Tobacco and Firearms

### **Purpose**

To initiate a project through the Crime Gun Analysis Branch to study current and potential methods to be utilized in the restoration of obliterated serial numbers on crime guns.

The Crime Gun Analysis Branch (CGAB) has recently initiated a project aimed at the restoration, collection, and analysis of data relative to firearms that have been recovered with their serial numbers removed by methods of obliteration.

Historically, obliterated serial numbers on crime gun recoveries are not raised unless there is a specific investigative requirement, i.e., homicide. When these numbers are raised or even partially raised, NCIC and TECS are used to research the status of the weapon and subsequently report positive results to the requester. This information provides a firearms trafficking investigative lead which should be proactively pursued because any firearm that has had the serial number intentionally obliterated has only one purpose—crime. Unfortunately, because of the narrow scope of jurisdictional enforcement in most city and State police departments, these trafficking leads are ignored, often deferring investigative efforts to the local case at hand. If this information is incorporated into Project Lead (which is available in the upgraded version), queries can be made to link information on persons involved in trafficking crime guns using methods of serial number obliteration. The mere fact that a serial number has been obliterated is an absolute "intent to traffic" indicator.

Unfortunately, there has been no coordinated effort to proactively target leads on obliterated serial numbers seized by Federal, State, and local agencies. Labs are swamped and unable or unwilling to handle the potential number of obliterated crime guns now sitting in evidence vaults across the country. These guns are "one step from the burner," yet the information that could be generated from just a few restored numbers is still untested, and intelligence on firearms traffickers remains uninvestigated, because the firearms are being destroyed along with valuable serial number information. Also, due to lack of resources and manpower in the field, firearms with obliterated serial numbers are very seldom investigated because ATF does not routinely try to raise these numbers despite the fact that criminal intent is absolute when serial numbers are obliterated. These are the best leads available to start investigating and removing crime gun traffickers from the streets.

The NTC has determined that raising serial numbers is relatively easy to learn and inexpensive to render. For nonmagnetic guns, generally the cheap handguns (Raven, Lorcin, Davis, etc.) that predominately turn up as crime guns, the investment is approximately \$60 of chemicals that can be mixed in individual batches that have a 30-day shelf life.

Magnetic guns require a different chemical mixture with a similar price and shelf life. Additionally, magnetic techniques can also be applied in combination with chemical techniques for greater success in restoring obliterated markings on magnetic surfaces. This opens opportunities in geographic areas that recover magnetic crime guns of a higher quality (Smith & Wesson, Colt, etc.). The training for certification to restore obliterated serial numbers takes only two days and is a relatively simple concept.

The NTC would like to propose the initiation of an obliterated serial number research program to be housed at the NTC. This program would consist of one special agent, currently detailed to the NTC as a Project Officer, and administrative support. The purpose of this program would be to train special agents in the field on the importance of raising serial numbers in relation to firearms trafficking. In order to provide this information to the field, the special agent detailed to the NTC would travel to each field division and obtain information on possessors associated with obliterated serial numbers and raise serial numbers from crime guns in State and local police department vaults. Once this information is obtained, these firearms will be traced and this information, along with possessor information, will be entered into Project Lead for link analysis.

The NTC recognizes the insufficient manpower in the field and would, in addition to entering this information into Project Lead, research obliterated gun information to build the foundation of firearms trafficking investigations to be referred to the field.

As a basis for this proposal, the NTC has received a list of some 67 restored serial numbers from obliterated serial number firearms sent to the NTC from the Boston Field Division. With the first raised serial number, the NTC traced the firearm and queried the possessor information. The NTC discovered that the individual identified as the purchaser has purchased more than 430 firearms by way of past multiple sales and has since referred the information to the New Orleans Field Division, which has opened a substantial firearms trafficking investigation. This was just one firearm, and more than 430 other firearms were found to be associated to the individual.

Imagine the firearms trafficking cases sitting in vaults just waiting to be investigated. This is a major avenue that has not even been touched. Imagine the impact this could have to enhance ATF's Firearms Trafficking Strategy. The results could be phenomenal because never before has a Federal law enforcement agency chosen to specifically target those individuals associated with the obliteration of serial numbers on crime guns.

# Situational Factors Related to Public Mass Murder Incidents: 1965-1998

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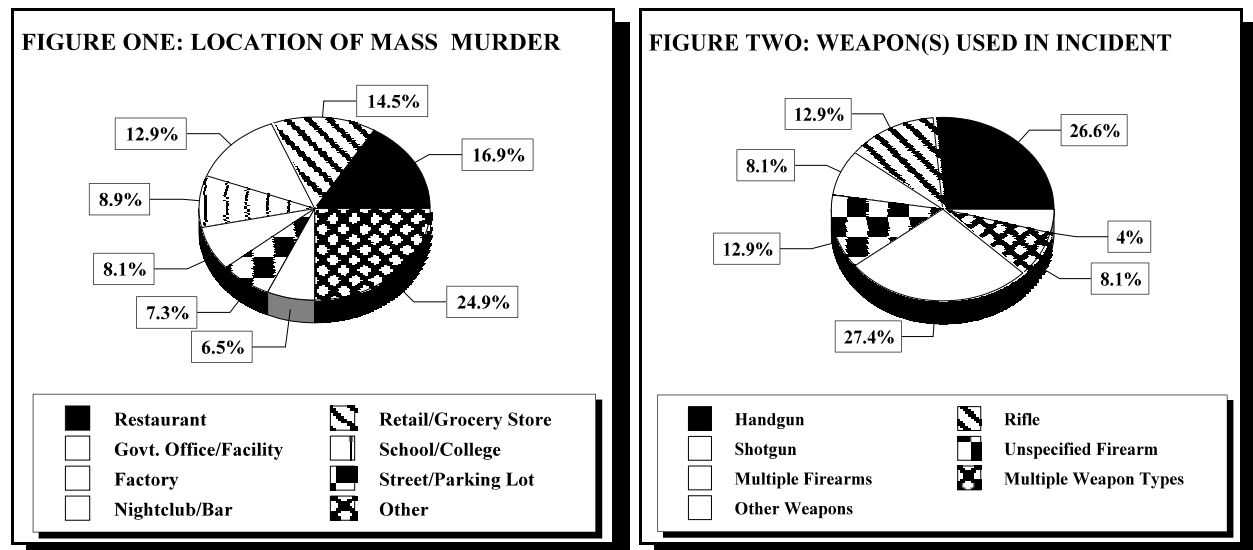
## Abstract

This project analyzes 124 public setting mass murder incidents that occurred in the United States between 1965 and 1998. Situational factors such as the primary location of the murders, weapon choice, duration of the event, and how the incident ended were examined to determine if any patterns exist in mass murder events.

## Analyzing Mass Murder

Recent events in Pearl, Mississippi, West Paducah, Kentucky, Jonesboro, Arkansas, and Springfield, Oregon, have resulted in a renewed interest in public episodes of mass homicide. The present study examines 124 incidents of mass murder, defined as the murder of three or more people in one place at one time (see Petee, Padgett and York, 1997 for a detailed discussion of what constitutes mass murder), that occurred in public settings in the United States between January 1965 and May 1998.

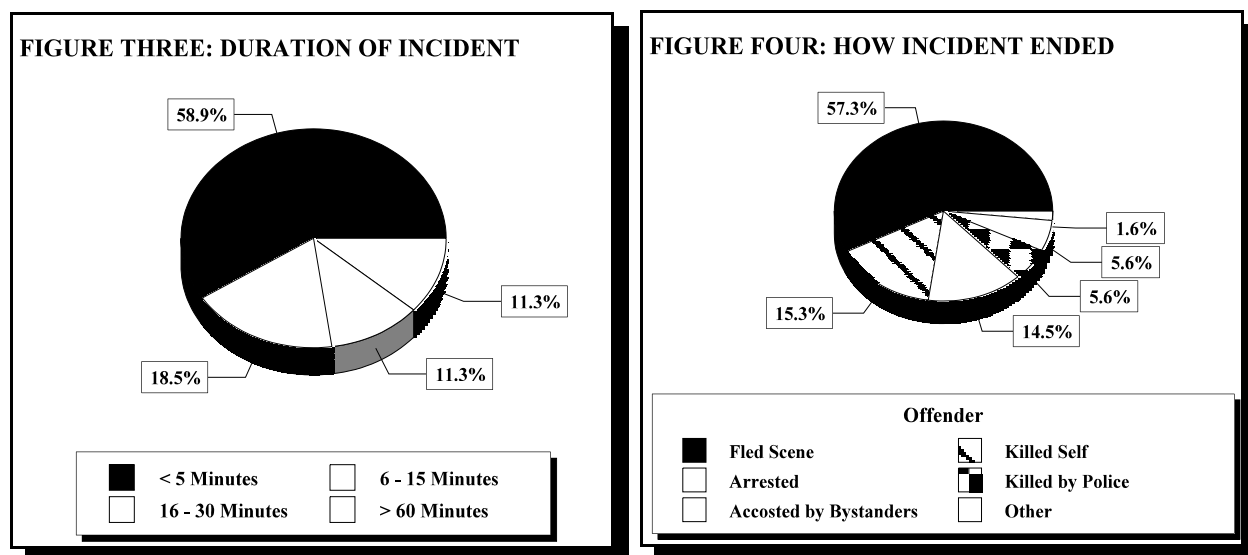
Despite concerns over the recent murders that have taken place in school settings, there appears to be no particular pattern to the specific place where public mass murder incidents occur (see Figure One). While restaurants were the most frequent place where mass murders transpire (16.9% of all incidents), there was no single dominant setting for these events. In some cases, the murders occur at an "at-risk" location (e.g., retail/grocery stores for felony-related mass murders). In other cases, the location has some significant meaning for the offender (e.g., the law firm targeted by Gian Luigi Ferri in San Francisco in 1993), or is situationally-related (e.g., in





direct conflict situations- see Petee et al., 1997). Given the differences found in offender motivation, the variation in location for mass murder is not all that surprising.

Frequently, discussion of mass murder tends to focus on issues related to firearms. Typically, mass murder incidents such as that perpetrated by Colin Ferguson on a commuter train in New York City in 1993, or by Joseph Wesbecker in a printing plant in Louisville, Kentucky in 1989 will generate a heated debate over the merits of gun control (Petee, York and Padgett, in press). Indeed, an examination of the weapons used in public incidents of mass murder (see Figure Two) reveals that firearms are the weapons of choice for this type of homicide. In only 12.1% of the cases did the offender(s) use a weapon other than some form of firearm. While it is hard not to conclude that the presence of firearms makes for a more lethal encounter (the exception being



explosives or arson), the actual impact of gun control on the occurrence of mass murder is debatable. A closer examination of these incidents indicates that in most cases the weapons used were legally obtained, and were not of the variety commonly banned by gun legislation (i.e., “assault” weapons).

The response of law enforcement agencies to these types of incidents is another commonly cited concern pertaining to mass murder. Figures Three and Four examine the duration of mass murder incidents and how these incidents ended respectively. In the majority cases, the homicide episode lasted 5 minutes or less (58.9%), and the incident ended with the offender fleeing the scene (57.3%). These findings certainly call into question what impact, if any, law enforcement could have on these incidents.

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## **D.C. Jail Gun Identification and Style Survey**

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### **Introduction**

Urban jail inmates report much familiarity with firearms. This project examined and compared the ability of different age groups of inmates to match the name of a gun to its photograph. Additionally, the project asked the different age groups to discuss features that they admired about particular guns and to identify the gun that they would most want.

### **Method**

The study was conducted during two weeks of July, 1997, at the municipal jail for the District of Columbia. Pictures of nine different guns on a worksheet were shown to 135 pre-trial detainees during voluntary health education classes. The pictures were chosen from a handgun catalog by three randomly selected male detainees as guns which they believed would be recognized by fellow detainees. (The guns were the Uzi, Tec-9, AK-47, Mac-11, Phoenix Arms Raven, Calico M110, Glock 19, Jennings J-25, and Colt Detective Special). See Table 1. Detainees were asked to privately match the name of the gun to the picture of the gun. On a separate worksheet, detainees were asked to identify the gun they would want to have. Additionally, they were asked to list nicknames for each gun and features which they admired, if any, about each gun. The detainees indicated their ages on the worksheets, but no name or identifying information.

### **Results**

Ninety-six percent (96%) of the 15-19 year old males could correctly match the manufacture's name to the gun. Each successive age group was less successful in correctly identifying the guns in nearly a linear distribution. See Table 2.

When asked to identify the gun that they would most like to have, younger inmates chose weapons with a menacing appearance and reputation for rapid fire and multiple rounds (the Calico was their first choice). Older inmates preferred guns which were smaller (the Glock was their first choice). Younger detainees listed admired gun features which represented speed, destruction, or style. Older detainees listed admired gun features which highlighted utility or practicality. The results suggest that younger detainees are attracted to the manufacturing style and power of guns, while older detainees are more attracted to the utility of the weapon.

# **Exploring Circumstances of Prior Gunshot Wounds Among Jail Detainees**

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## **Introduction**

Many detainees in urban jails have sustained prior gunshot wounds. The purpose of this study was to explore the circumstances surrounding these shootings and how the shootings impacted their lives.

## **Methods**

Detainees entering the city jail in Washington, D.C., from April through June, 1997, were screened for a history of gunshot wounds. One in 4 of the males had been shot before. Extensive interviews were then done with every third male detainee who reported a prior gunshot wound within the past 5 years until 92 interviews had been completed.

## **Results**

A whole continuum of injuries were represented, from single superficial extremity injuries to extensive multiple wounds to the head and torso. Two different clusters emerged based upon the seriousness of the shooting, the circumstance of the shooting and the perceived intention of the shooter. The first cluster involved injuries sustained during arguments, retaliation, or assaults. These wounds tended to have the greatest potential for death. Victims of these shootings were 2-3 fold more likely to have been shot with multiple bullets. They also were more likely to sustain injuries to the head or torso. See Table 1.

This group also were more likely to believe that their shooter meant to kill them. They were more likely to carry a gun after the shooting, more eager to retaliate, and could identify more ways in which the shooting changed their lives including substance abuse and "vicious" behavior.

The second cluster consisted of injuries sustained during robberies, carelessness, crossfire, or police fire. These wounds tended to be less threatening. Victims were more likely to sustain single wounds. They were more likely to be injured in an extremity. See Table 2.

Members of this group were either uncertain of their shooter's intention or did not believe their shooter meant to kill them. They were less likely to carry a gun after the shooting, less likely to retaliate, and experienced less life-altering sequela.

Further exploration of these findings might be useful in designing interventions and responses to survivors of firearm injuries, particularly in interrupting a response of gun-carrying and retaliation.

## **The Spousal SROK\* Revisited: A Comparison of Houston and Chicago Intimate Partner Homicide**

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Funded by the National Institute of Justice and the National Consortium on Violence Research. Findings and conclusions of the research reported here are those of the authors and do not necessarily reflect the official position or policies of the U.S. Department of Justice or the National Consortium on Violence Research.

\* In a provocative cross-cultural examination of intimate partner homicide, Wilson and Daly (1992) found that the spousal “sex ratio of killing” (SROK) was approximately twice as great in the U.S. as other Western nations, including Canada, Australia, and Great Britain.

In this analysis of Intimate Partner Homicide in Chicago and Houston, we find both notable similarities and differences in the SROK when disaggregated by race/ethnicity, weapon used, and coresidency.

Wilson, Margo I., and Martin Daly. 1992. “Who Kills Whom in Spouse Killings? On the Exceptional Sex Ratio of Spousal Homicides in the United States.” *Criminology* 30, 2: 189-215.